

ARLINGTON'S ENERGY FUTURE

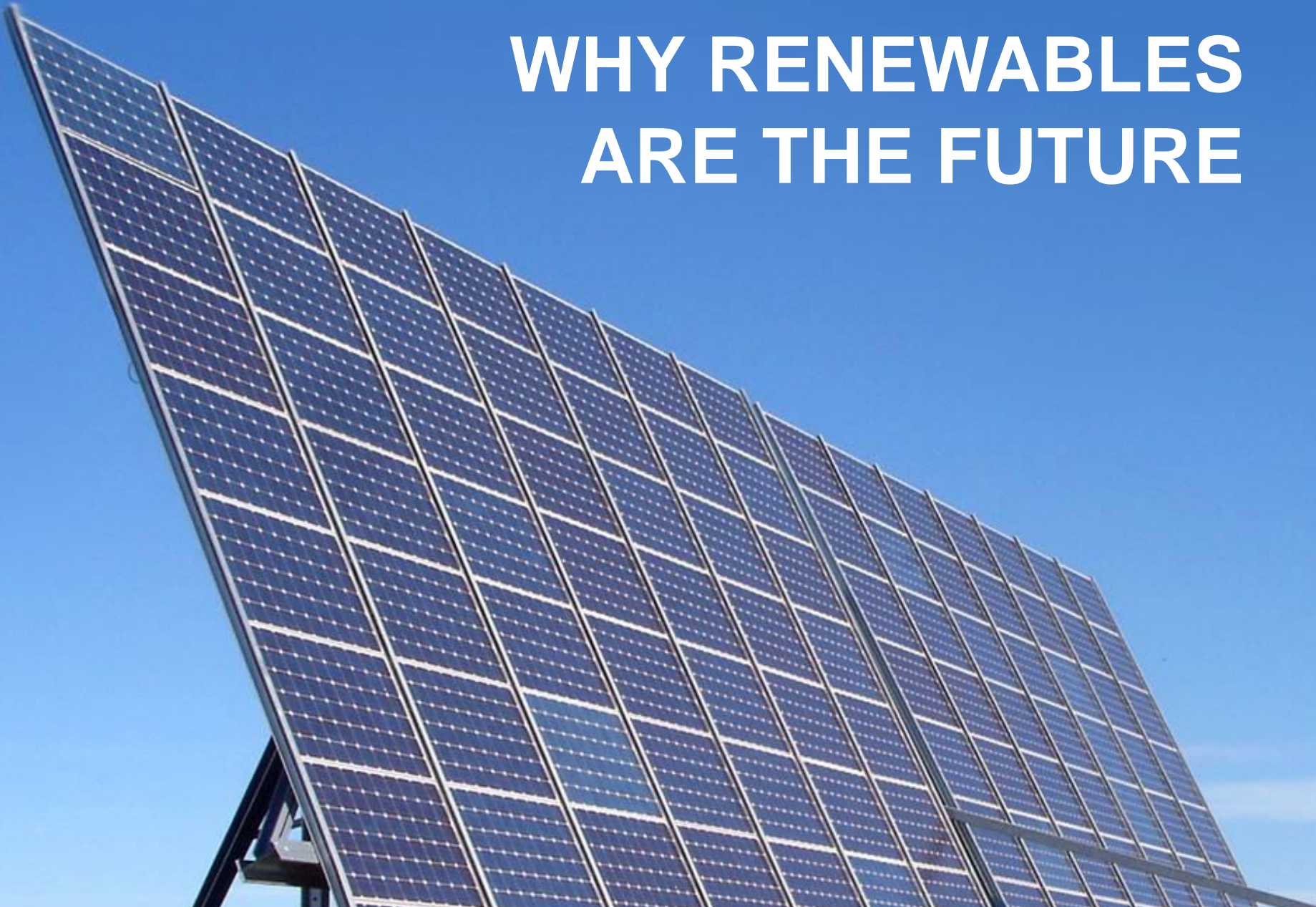


ARLINGTON'S ENERGY FUTURE

Overview

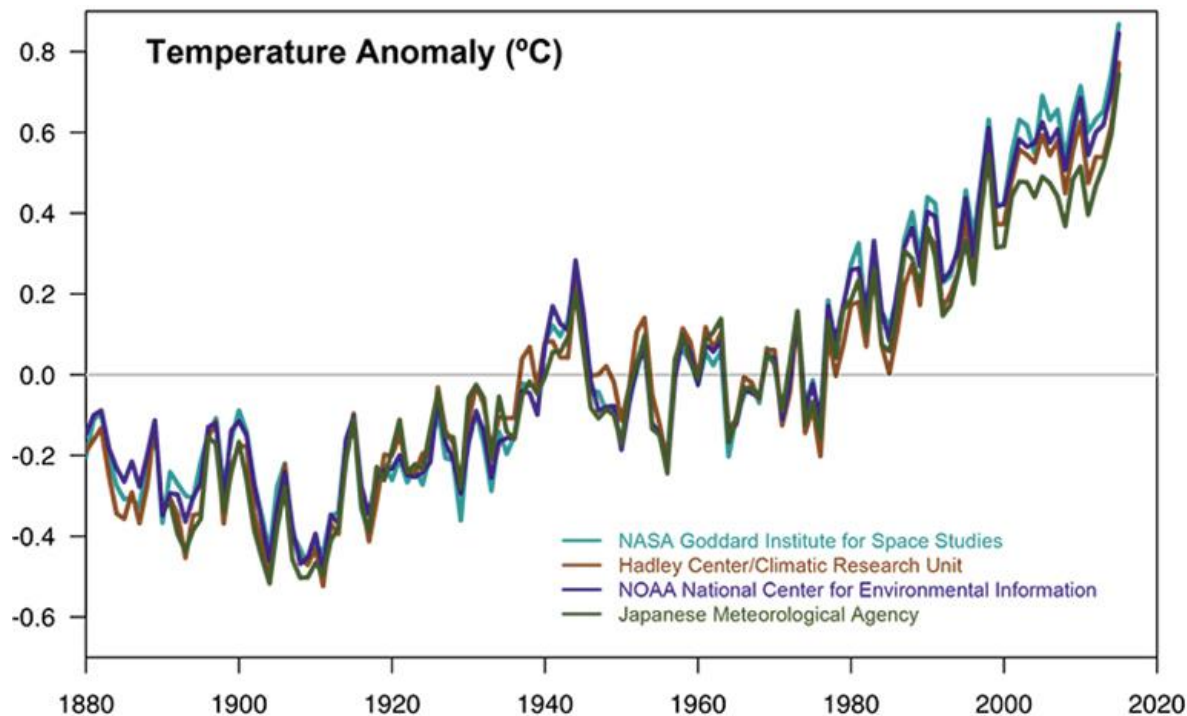
1. Why renewables are the future
2. Electricity use in Arlington
3. Policy challenges and opportunities
4. Putting it all together: How Arlington can achieve 100% renewable electricity by 2035
5. Discussion

WHY RENEWABLES ARE THE FUTURE



WHY RENEWABLES ARE THE FUTURE

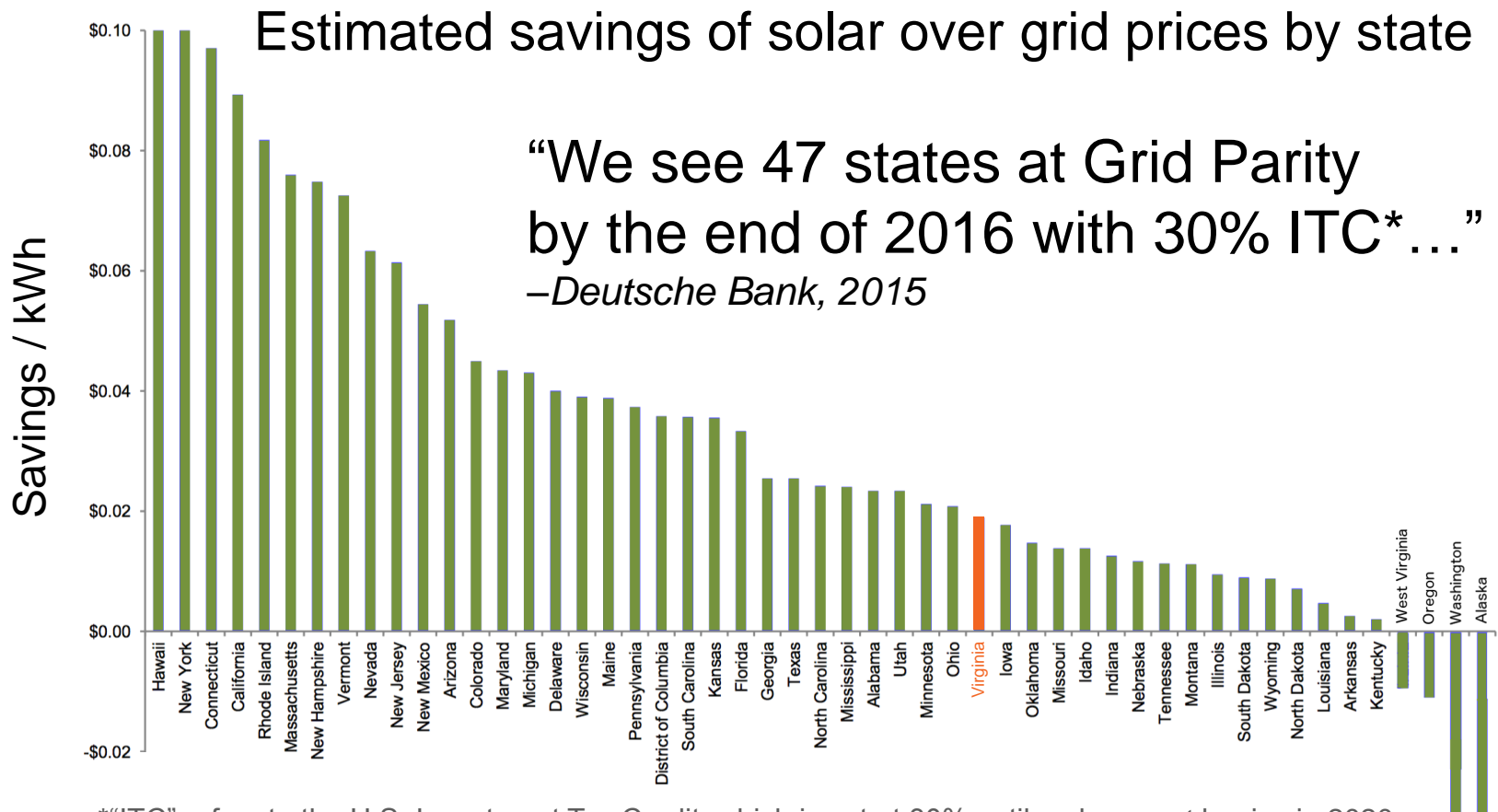
- 1. Necessity:** There is overwhelming scientific consensus that we must transition to renewable energy as soon as possible



From NASA's Global Climate Change website (climate.nasa.gov/scientific-consensus)

WHY RENEWABLES ARE THE FUTURE

2. Economics: Solar and wind **grid parity** is here



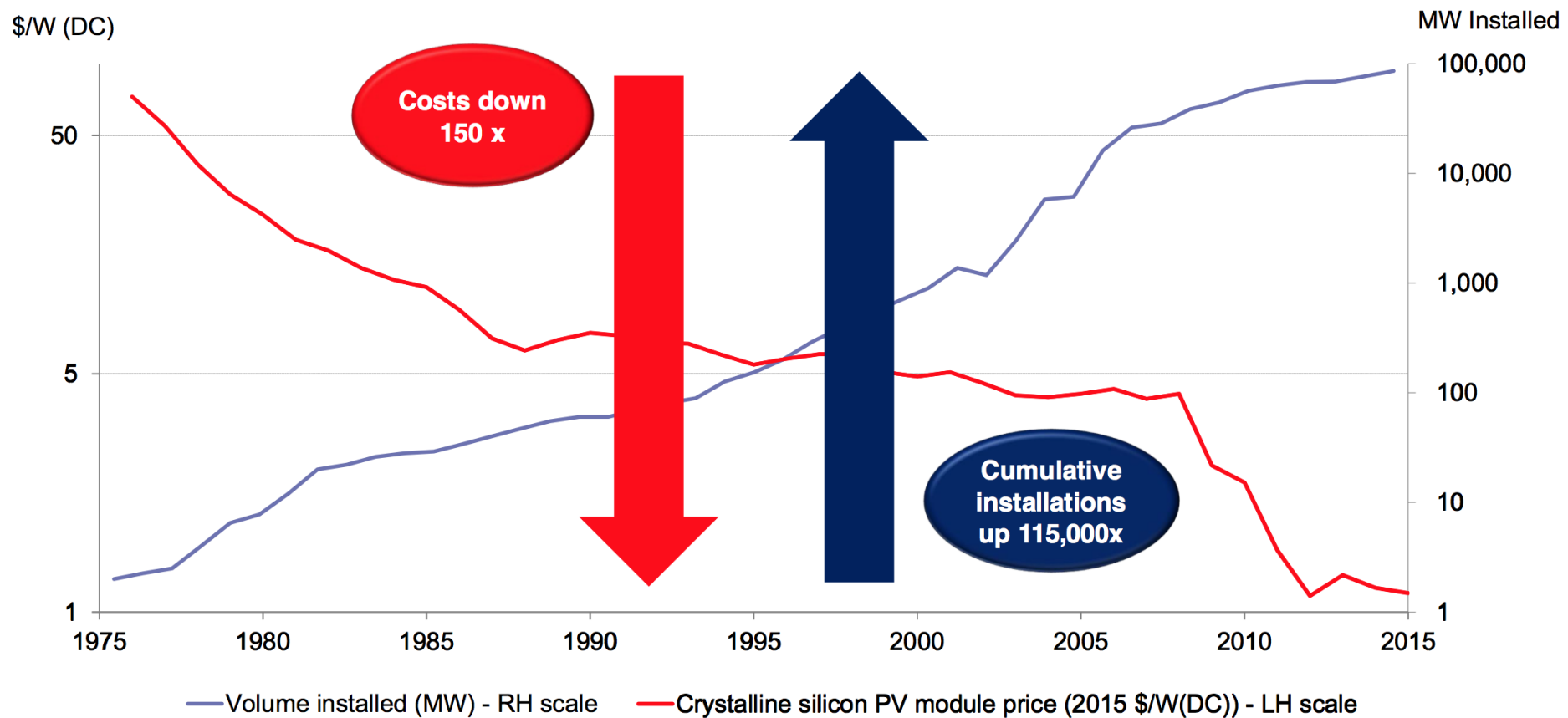
*“ITC” refers to the U.S. Investment Tax Credit, which is set at 30% until a phase-out begins in 2020.

Deutsche Bank Securities, Inc., *Solar Grid Parity in a Low Oil Price Era*, February 2015, available online at

https://db.com/cr/en/docs/solar_report_full_length.pdf

WHY RENEWABLES ARE THE FUTURE

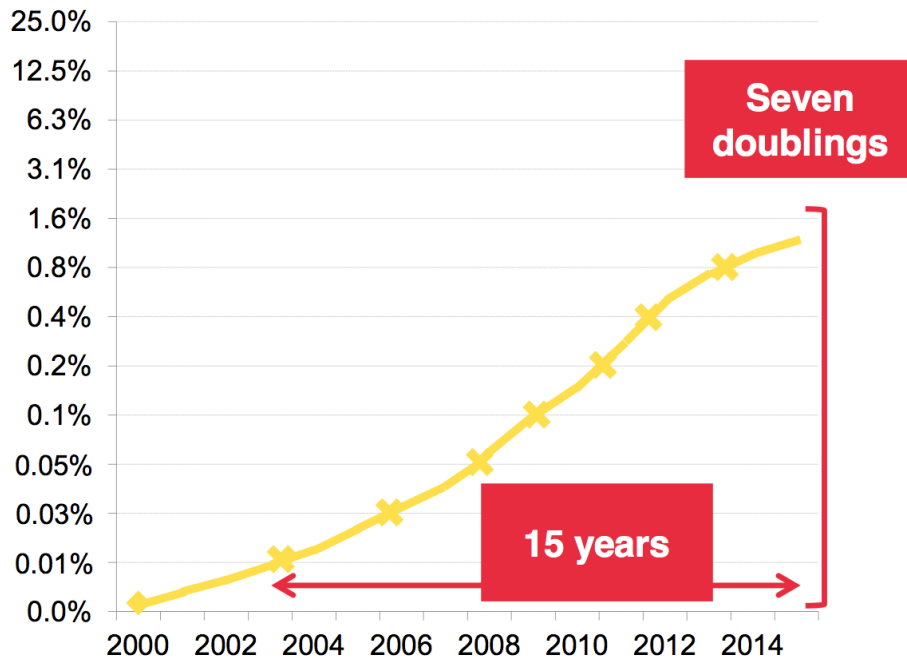
Solar costs are falling fast



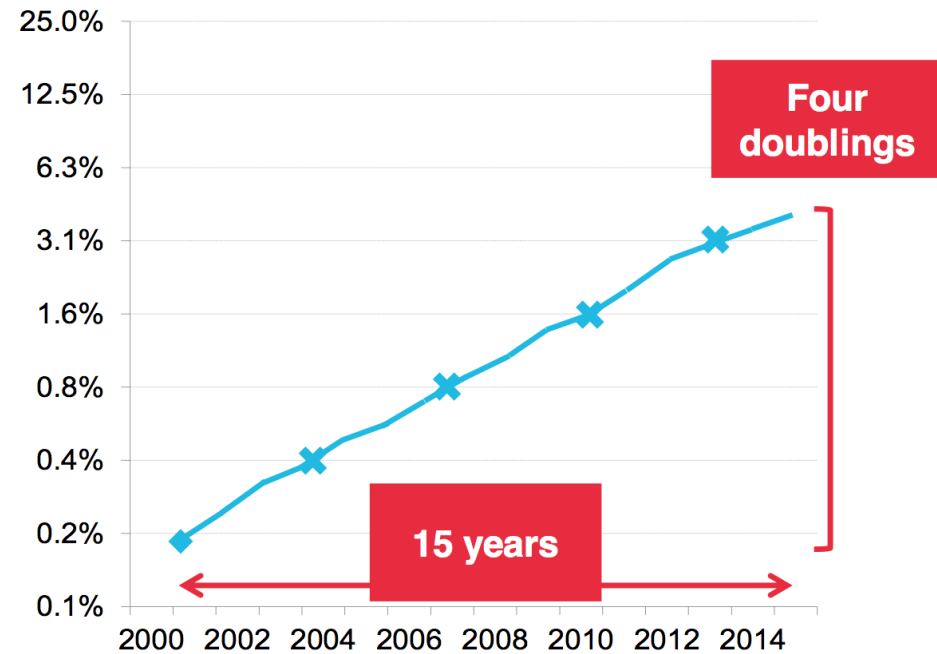
WHY RENEWABLES ARE THE FUTURE

Solar and wind are growing exponentially

SOLAR



WIND

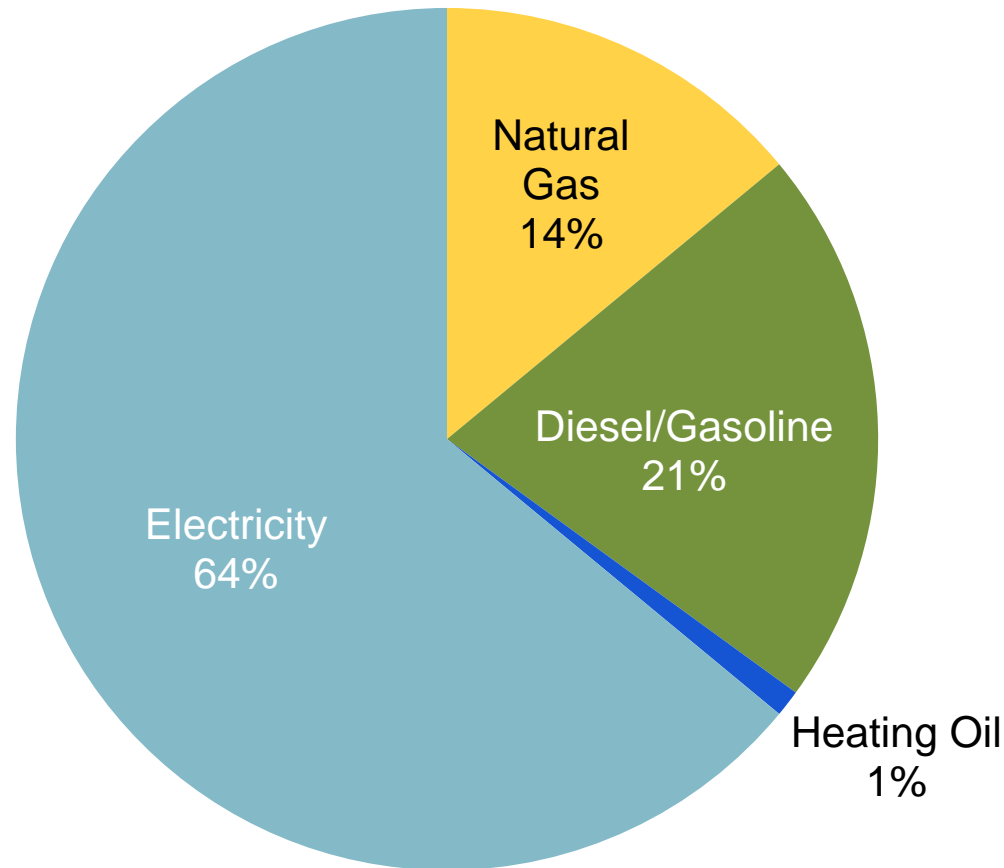


ELECTRICITY USE IN ARLINGTON



ELECTRICITY USE IN ARLINGTON

Electricity use is about two-thirds of Arlington's total energy use

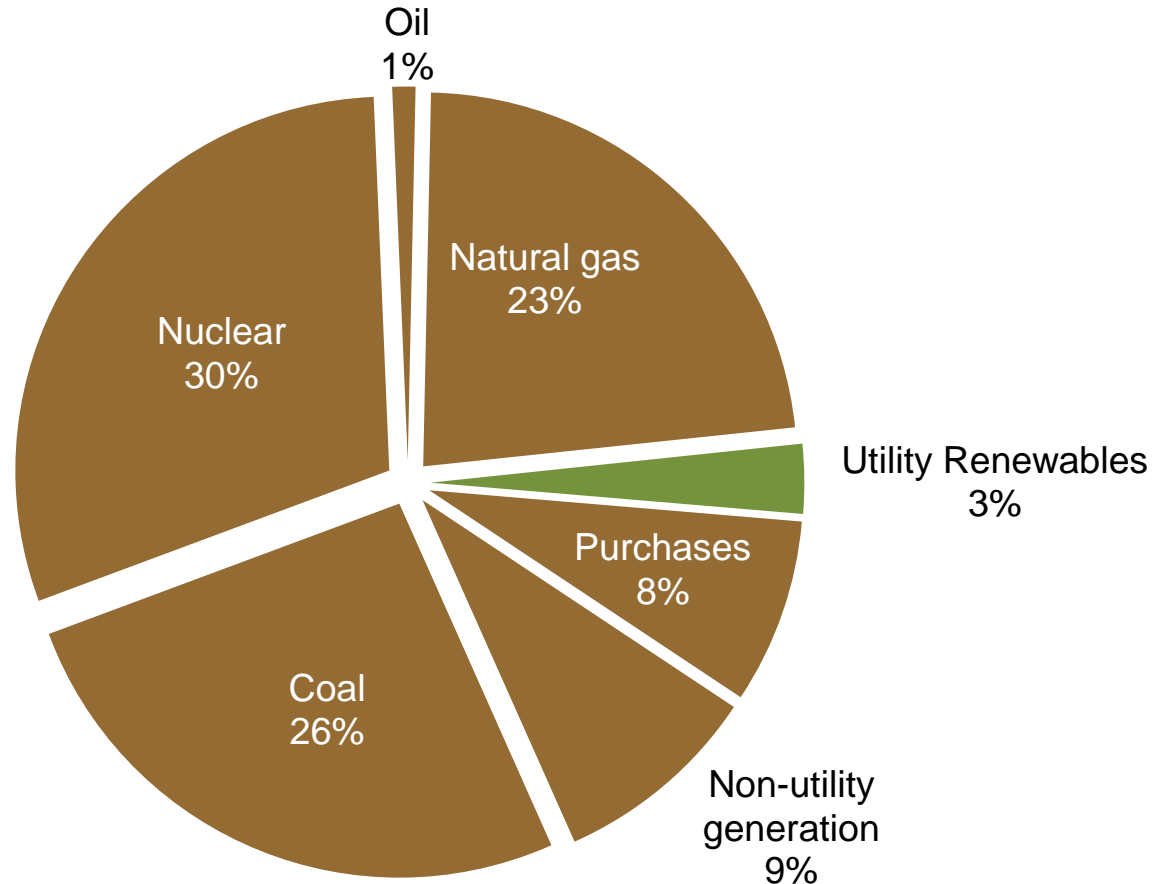


Arlington County Community Energy Plan, p. 6 (2007 data)

<https://environment.arlingtonva.us/energy/community-energy-plan-cep/>

ELECTRICITY USE IN ARLINGTON

Dominion supplies Arlington's electricity from these sources:

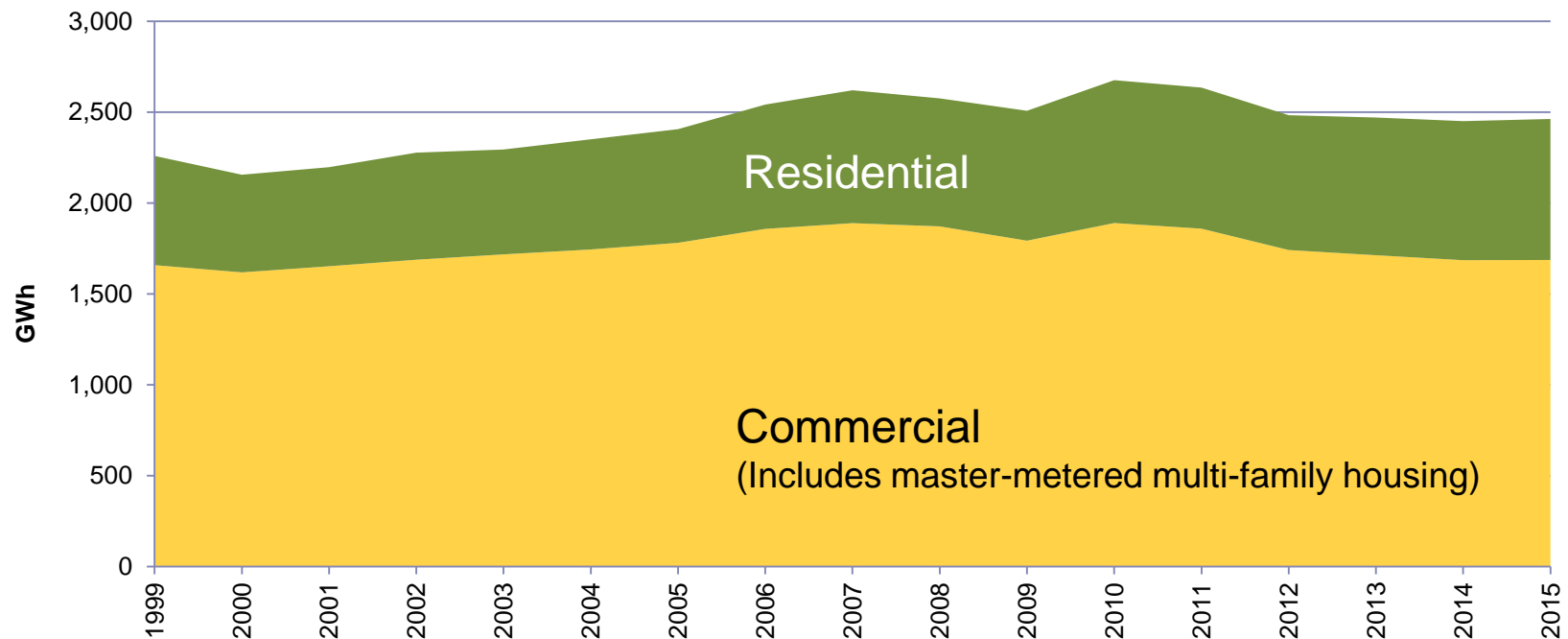


2015 Energy mix

Dominion Integrated Resource Plan (2016) at 37, available online at <http://dom.com/library/domcom/pdfs/electric-generation/2016-irp.pdf>

ELECTRICITY USE IN ARLINGTON

The commercial sector uses about twice as much electricity as the residential sector in Arlington. Despite population growth, energy use has declined since 2010.



Data from Arlington County, "Utility accounts & usage", available online at <https://data.arlingtonva.us/dataviews/231353/UTILI-ACCOU-USAGE/>

ELECTRICITY USE IN ARLINGTON

Community Energy Plan Benefits

- Greenhouse gas reduction
- Economic competitiveness
- Energy security and reliability
- Energy efficiency
- Environmental leadership

ELECTRICITY USE IN ARLINGTON

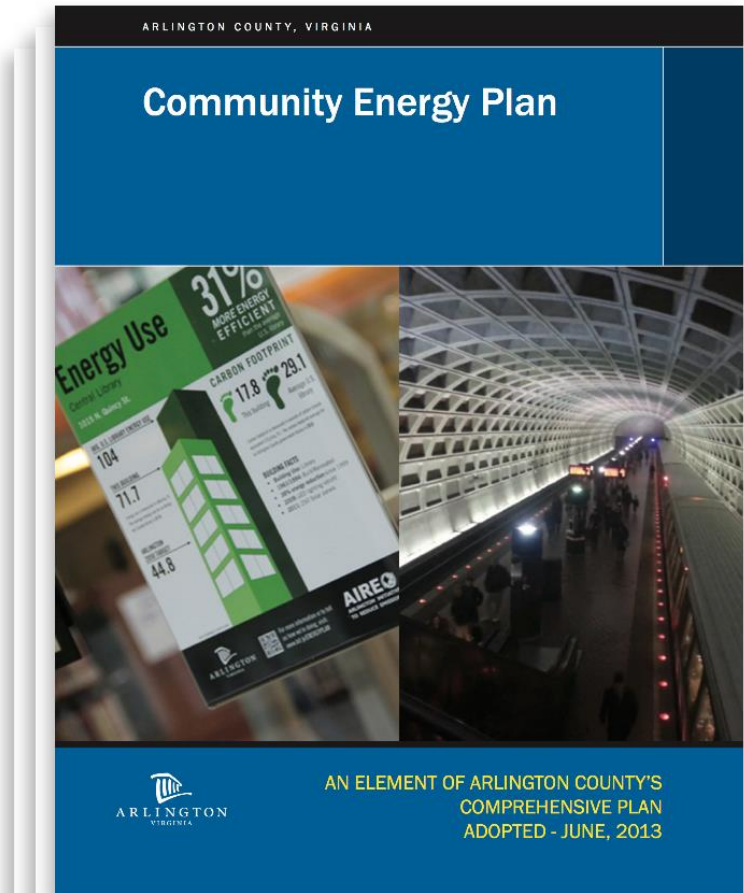
Key CEP Electricity Goals

Goal #1: Use 25% less energy than 2007 in all buildings by 2030

Goal #3: Become a “solar leader”; add 160 MW solar by 2050

Goal #5: Integrate CEP goals into county activities

Goal #6: Support personal action through behavior changes and effective education



ELECTRICITY USE IN ARLINGTON

Key CEP Implementation Framework Renewable Strategies*

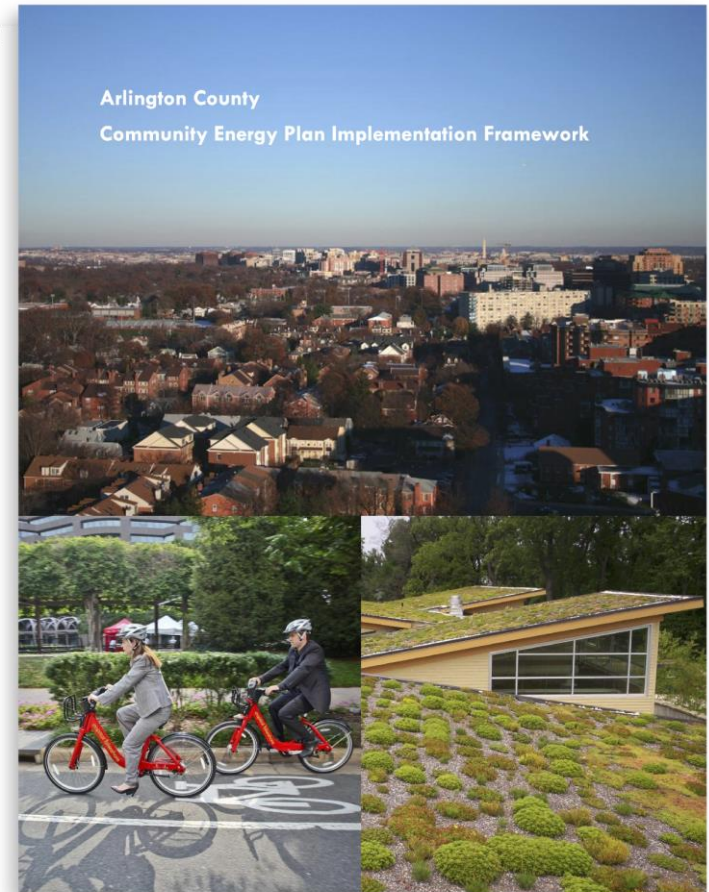
Strategy #1: Provide Incentives

Strategy #2: Eliminate regulatory & legislative barriers

Strategy #3: Encourage renewable design integration in development

Strategy #4: Work with utilities to encourage renewables

Strategy #5: Encourage solar hot water and other renewables



*From: *Arlington County Community Energy Plan Implementation Framework*, p. 14-16.

POLICY CHALLENGES AND OPPORTUNITIES



POLICY CHALLENGES AND OPPORTUNITIES

State policy poses greatest challenges

- The Dillon Rule limits local control
- Utility companies hold broad political power in Richmond
- Renewable energy supporters are working together to improve policies in Richmond



POLICY CHALLENGES AND OPPORTUNITIES

1. Net metering is under threat

- Virginia program ends when rooftop solar reaches 1% of market
- Utility companies have strong incentives to weaken or end net metering, and are succeeding in some states
- Defending net metering is an important long term priority



By Dwight Burdette - Own work, CC BY 3.0
<https://commons.wikimedia.org/w/index.php?curid=18484023>

POLICY CHALLENGES AND OPPORTUNITIES

2. Stand-by charges for > 10KW systems

- Limits systems for large homes and Electric Vehicles
- Legislation needed to end charges



POLICY CHALLENGES AND OPPORTUNITIES

4. Community Solar

- Group shares joint ownership of solar project
- Enables solar for those without “ideal” rooftops
- Legislation is needed to allow this approach in Virginia

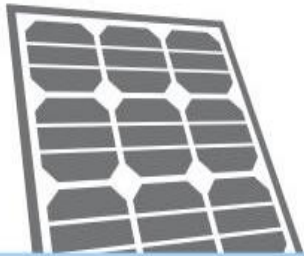


POLICY CHALLENGES AND OPPORTUNITIES

3. Third Party Ownership and Power Purchase Agreements (PPAs)

SOLAR PPA

Facility Owner



- Provide location for solar installation
- Agree to purchase electricity at discounted / fixed rate for 20 years under a PPA
- Agree to 20-year lease term
- No capital investment for installation or operation of solar system

System Owner



- Design, Permit, Finance, Install and Operate solar system
- Provide electricity at a discounted / fixed rate
- Manage all interaction with utility
- Remove or handover ownership of solar array at end of 20 years

Capital
Investment +
Electricity

20-Year Lease +
PPA Payments

PPAs

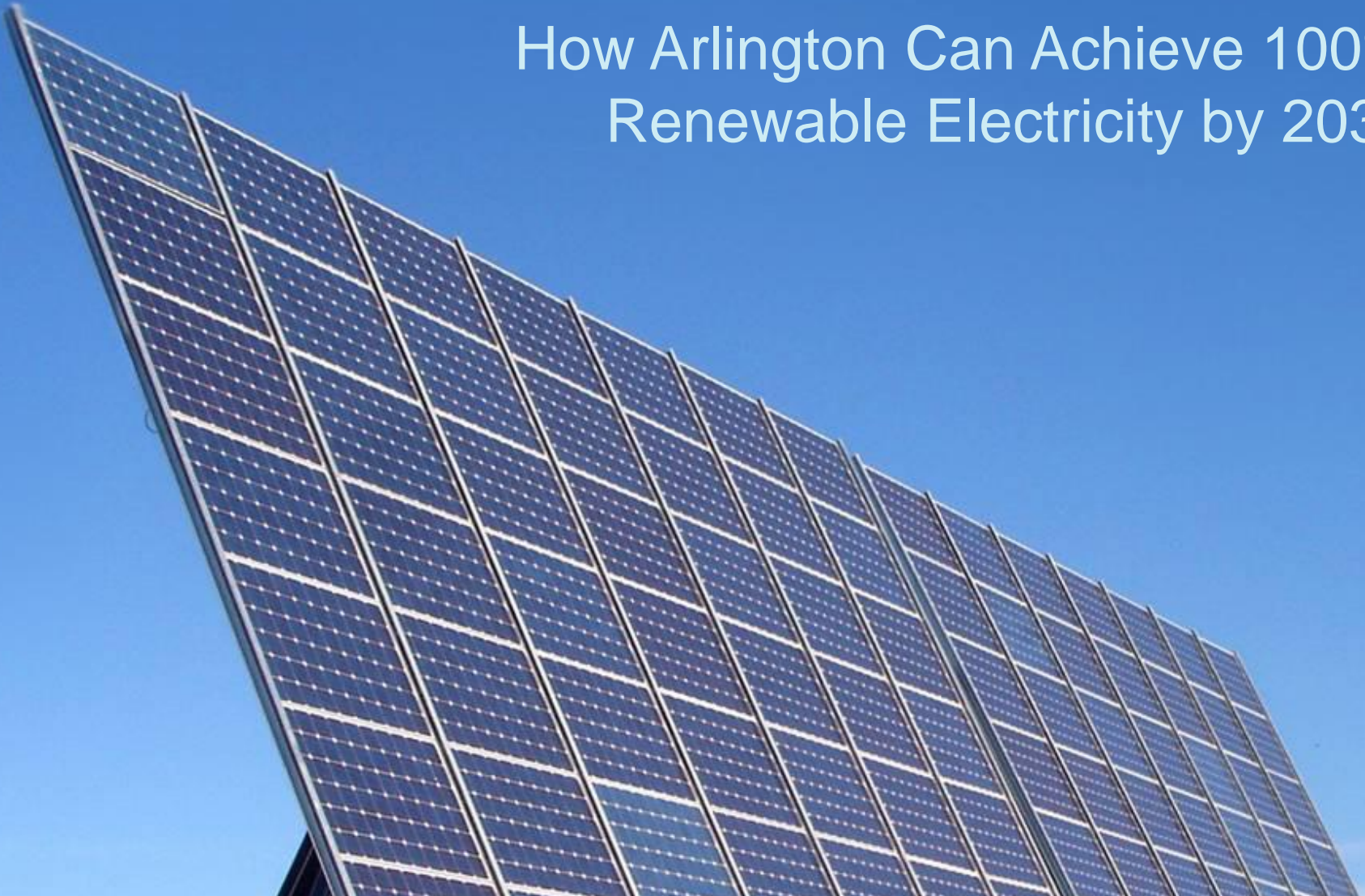
- Customers buy renewable power from the solar system owner
- Face legal challenges in Virginia

“Virtual PPAs”

- More complex contract that does not involve “purchase” of electricity, but achieves results similar to a PPA
- Legal in Virginia

PUTTING IT ALL TOGETHER

How Arlington Can Achieve 100%
Renewable Electricity by 2035



HOW ARLINGTON CAN ACHIEVE 100% RE

Core questions in assessment and planning:

1. How much electricity will we need in 2035?

Current demand + growth - efficiency gains

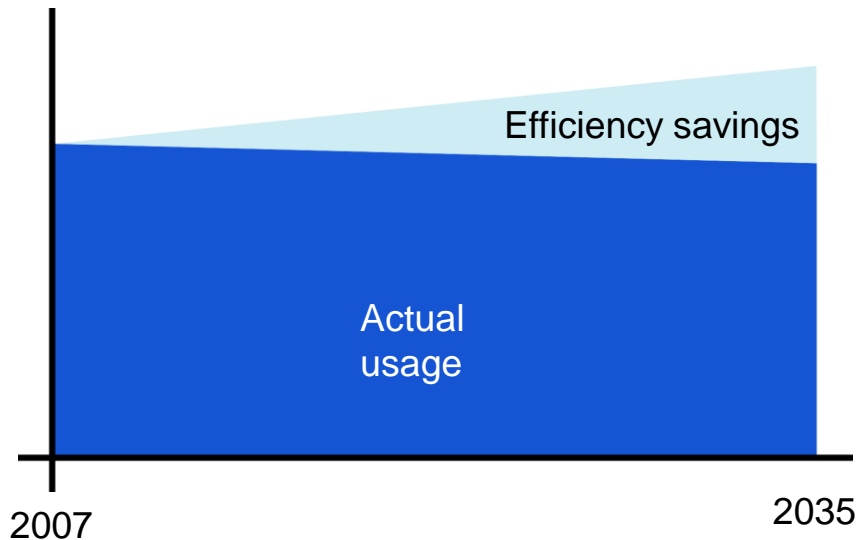
2. Where will it come from?

Dominion + local RE + external RE + RECs

Let's see how these numbers add up...

HOW ARLINGTON CAN ACHIEVE 100% RE

How much electricity will Arlington need in 2035?



2.62 TWh = Actual 2007 use
(commercial and residential)

2.5 TWh = Estimated 2035
use

Rationale:

1. Estimated population growth 2007–2035 = 33.7%

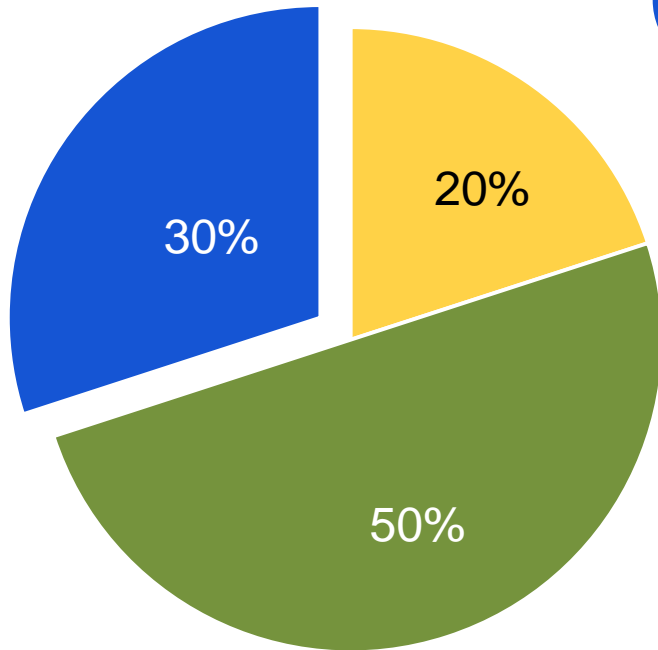
Source: <https://projects.arlingtonva.us/data-research/future-data-forecasts>

2. Estimated efficiency gain 2007–2035 = 30%

Source: CEP calls for all buildings to be 25% more efficient than 2007 by 2030; 2030–2035 efficiency gains estimated at 1% per year

HOW ARLINGTON CAN ACHIEVE 100% RE

Where can we get 2.5 TWh of renewable electricity in 2035?



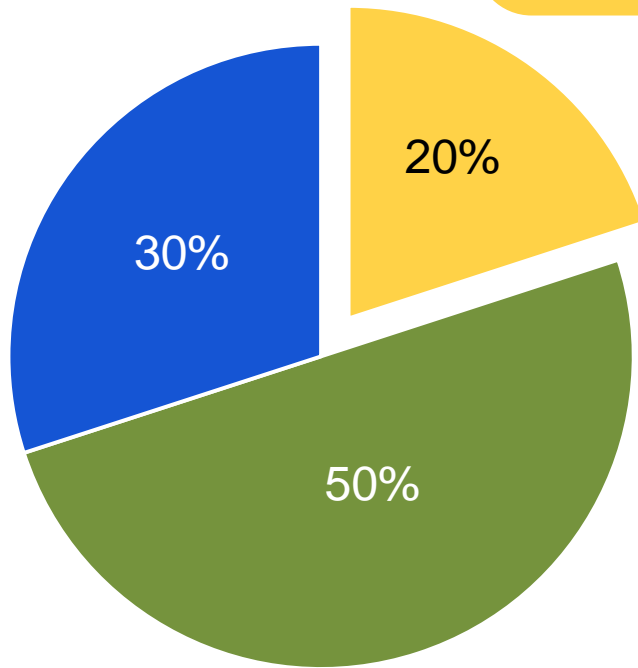
Dominion: 30% or more

- Based partly on Dominion's commitment to reach 15% renewable by 2025, extrapolated to 2035
- Market forces and policy changes will determine whether Dominion meets or exceeds this estimate

HOW ARLINGTON CAN ACHIEVE 100% RE

Where can we get 2.5 TWh of renewable electricity in 2035?

Local solar power: 20%



- Current rooftop potential = 500 MW,* or 25% of what is needed**
- Projected gains in panel efficiency and price will increase potential to about 80% of what is needed
- Achieving only 25% of that potential by 2035 = 20% of the total amount needed
- Means converting about 1% of Arlington's electricity use to solar each year, with greater amounts installed in later years

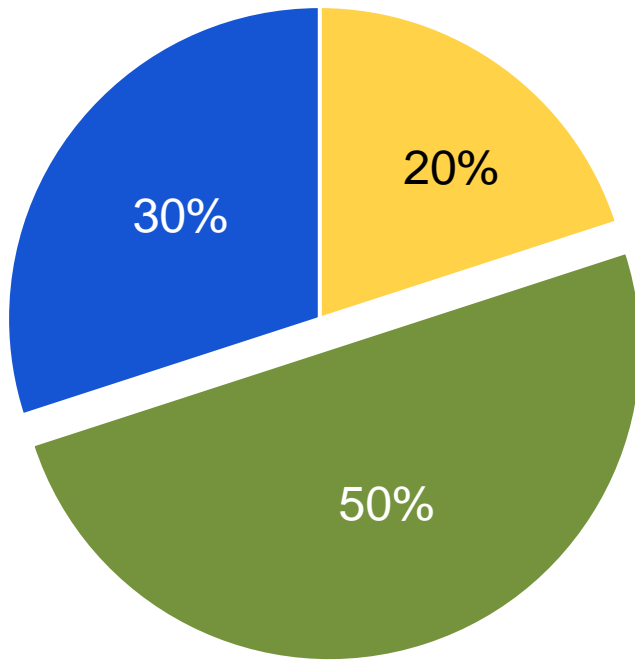
* Total rooftop potential as measured by the Northern Virginia Regional Commission's Solar Map, available online at <http://www.novasolarmap.com>; estimate of 494.731 MW provided by NVRC staff, September, 2016.

** Annual generation potential per installed MW estimated at 1,246 MWh/year. This is the rate used for small buildings in Virginia by the National Renewable Energy Laboratory (NREL), "Rooftop Solar Photovoltaic Technical Potential in the United States: A Detailed Assessment," available online at <http://nrel.gov/docs/fy16osti/65298.pdf>, Table 3 (p. 26-27).

HOW ARLINGTON CAN ACHIEVE 100% RE

Where can we get 2.5 TWh of renewable electricity in 2035?

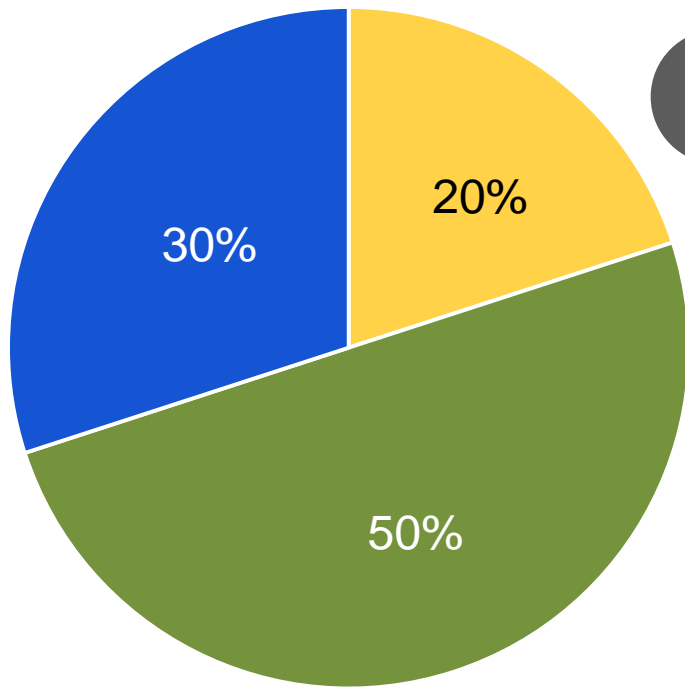
Renewable energy
purchased outside Arlington: 50%



- PPAs, VPPAs, Green Tariffs, Community Solar, etc. will enable consumers to buy utility-scale renewable power from outside Arlington
- Rapid decline in renewable prices makes these options affordable

HOW ARLINGTON CAN ACHIEVE 100% RE

Where can we get 2.5 TWh of renewable electricity in 2035?



Renewable Energy Certificates

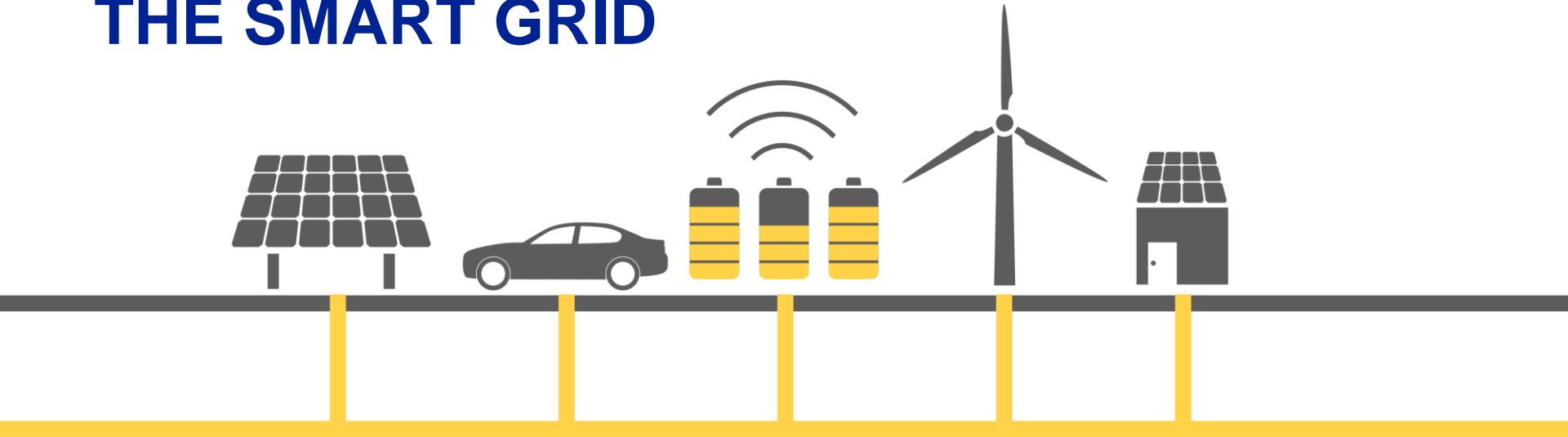
RECs are an acceptable way to temporarily address unanticipated shortfalls in Arlington's plan*

*For an overview of PPA's, VPPAs and RECs, see <http://www.energysmart.enernoc.com/a-practical-guide-to-renewable-energy-terms-what-are-ppas-virtual-ppas-and-recs/>

BUT WAIT A MINUTE!

**“ The grid can't handle all this
intermittent power, can it? ”**

THE SMART GRID



- The grid operator can handle 30% RE*
- Storage prices are dropping and the grid is getting “smarter”
- Many states and countries are way ahead — Virginia will learn from them
- Energy security will improve

* <http://www.pjm.com/~media/committees-groups/committees/mic/20140303/20140303-pris-executive-summary.ashx>

WHY COMMIT TO 100% RE?

It will help Arlington:

- Meet its Community Energy Plan goals
- Meet its economic development goals
- Enhance its energy security and resilience
- Become a clean, sustainable community
- Join other cities in becoming a “solar leader”

RENEWABLE CITIES

- 38 U.S. cities committed to 100% renewable electricity
- 5 already 100% RE
- 7,477 jurisdictions worldwide (including Arlington County) have committed to climate leadership by joining the Global Covenant of Mayors for Climate and Energy

Rock Port, MO

Greensburg, KS

Kodiak Island, AK

Aspen, CO

Burlington, VT

Abita Springs, LA

Angel Fire, NM

Atlanta, GA

Boulder, CO

Cambridge, MA

Columbia, SC

Del Mar, CA

Eagle Nest, NM

East Hampton, NY

Georgetown, TX

Hanover, NH

Hillsborough, NC

Madison, WI

Menlo Park, CA

Moab, UT

Monterey, CA

Nederland, CO

Nevada City, CA

Orlando, FL

Palo Alto, CA

Park City, UT

Portland, OR

Pueblo, CO

Questa, NM

Red River, NM

Salt Lake City, UT

San Diego, CA

San Francisco, CA

San Jose, CA

Santa Barbara, CA

Sarasota, FL

Solana Beach, CA

South Lake Tahoe, CA

Southampton, NY

St. Petersburg, FL

Taos, NM

Taos Ski Valley, NM

THANK YOU!

For more information please contact:

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Ready for 100 Campaign

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